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The Gordon Bell Memorial Lecture---On Food Poisoning

By Edwin Oakes Jordan, Ph.D.

Under the auspices of the Winnipeg Medical Society at Winnipeg, April 22, 1927

Food Poisoning

IN every generation there are some individuals whose influence on their contemporaries and associates is far greater than can be measured by the world's standards of tangible achievement. From these rare and happy men radiates a force, from them breathes a spirit, that sways the lives of others in a powerful, almost mysterious, manner. The capacity to win universal love is a gift of the high gods; the personality of the happy warrior touches his friends and associates with fire from aloft; something of his nature is transmitted to others by a kind of divine infection. Such a one was the man—our friend—whose memory will always refresh and restore our faith in the dignity and significance of human life.

It was my privilege to know Gordon Bell, and I count myself fortunate to be able to share, though in all too limited a degree, in your recollections of that fine spirit. His was a useful, serene, happy life.

> "Nothing is here for tears, nothing to wail
> Or knock the breast, no weakness, no contempt,
> Dispraise, or blame, nothing but well and fair . . ."

His love for outdoor life betokens his essential nature. One can imagine him quoting with approval the words of that kindred spirit, Thoreau: "I went to the woods because I wished to live deliberately, to front only the essential facts of life, and see if I could not learn what it had to teach, and not, when I came to die, discover that I had not lived."

Nothing could be more fitting, more in keeping with the life and spirit of our friend, than to have from time to time presented, as it were under his ægis, some discussion of those problems of human life and human wel-

fare to the solution of which he devoted his single-minded endeavor. In establishing this lectureship, his friends and fellow-townsmen have taken a sure way of perpetuating his memory. It is one of the means by which we may hope to pass on the sacred torch from bearer to bearer.

* * * * * *

One of the unsolved problems of public health at the present time and one in which I am sure Gordon Bell would have been deeply interested is the safeguarding of human food. The changes that have passed over the modern world in the last hundred years and that are still in progress have profoundly modified many conditions affecting human nutrition, as they have all other aspects of individual and community life. For the majority of the human race, especially for those living in the vast aggregations known as the modern city, almost every vestige of personal and individual control of food supply has disappeared. Foods are prepared in enormous quantities by machine methods, are transported hundreds and even thousands of miles, are handled by scores of persons before reaching our tables. Cheapness and abundance of food have been attained only at a price. We are dependent as never before on the skill of others in choosing, preparing, conserving, transporting and serving our food; and we are incidentally exposed to the hazards engendered by cupidity, ignorance and carelessness. Small wonder that the problem of controlling the character of city food supply is one of the most difficult and, considering all its ramifications, one of the most fundamental problems of public health.

A bewildering variety of factors has been found to influence the character, palatability and wholesomeness of foods.

Food Idiosyncracy. In certain remarkable instances a peculiar condition of the individual consuming the food is found to give rise to physiological disturbance. The human body has become sensitized in some way to a particular protein substance and the ingestion of even small quantities of this protein may produce rash, vomiting and other disagreeable consequences. Such well known examples of food sensitization as seen in the idiosyncracy of certain persons to strawberries, shellfish and even to eggs and milk, are obviously an individual physiological quality not to be attributed to any abnormality or inferiority inherent in the food.

Injurious effects due to the composition, contents or contamination of food itself are, however, sufficiently common.

Poisons inherent in Food. A relatively serious but fortunately rare cause of illness is found in the natural presence in certain plants and animals of highly poisonous substances. Perhaps the most familiar example of the danger from this source is the poisoning due to toxic varieties

of mushrooms eaten by mistake for wholesome varieties which they resemble. Numerous other plants, however, contain poisonous substances and are occasionally responsible for illness and death. The spindle-shaped roots of the deadly water hemlock (Cicuta maculata) are not infrequently mistaken by children for horse-radish, Jerusalem artichokes, parsnips or some other edible root.[1] Numerous deaths of stock animals on the range may sometimes be caused by the larkspur, by certain lupines, laurels and other plants. Poisonous honey may be derived from the blossoms of the azalea, the rhododendron and certain other nectar-bearing plants. Professor McCollum has recently recalled to me the description in Xenephon's Anabasis:

"After accomplishing the ascent the Greeks took up quarters in numerous villages, which contained provisions in abundance. Now for the most part there was nothing here which they really found strange; but the swarms of bees in the neighbourhood were numerous, and the soldiers who ate of the honey all went off their heads, and suffered from vomiting and diarrhoea, and not one of them could stand up, but those who had eaten a little were like people exceedingly drunk, while those who had eaten a great deal seemed like crazy, or even, in some cases, dying men. So they lay there in great numbers as though the army had suffered a defeat, and great despondency prevailed. On the next day, however, no one had died, and at approximately the same hour as they had eaten the honey they began to come to their senses; and on the third or fourth day they got up, as if from a drugging."

The mysterious disease, milksickness, long the scourge of American pioneer settlements in the Middle West, is due to a poison derived from the white snakeroot (Eupatorium ageratoides). In times of drought when pasturage becomes scanty, grazing cattle feed on this plant and the poison passes over into the milk of affected animals in such quantity that it produces a fatal illness in man.[2] The mother of Abraham Lincoln died from this cause in 1818 in southern Indiana.

Rarely the presence of natural poisons in widely purveyed food articles raises this danger to the importance of a public health problem. One instance is on record where an oil derived from a tropical plant which was used in a commercial butter substitute gave rise to a widespread outbreak of poisoning.[3]

According to recent dietary experiments by Edward Mellanby,[4] certain common food stuffs are thought to contain specific harmful

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[1]Cf. Gompertz, L. M.: Jour. Am. Med. Assn., 1926, 87, p. 1277.

[2]Sackett, W. G.: Jour. Infec. Dis., 1919, 24, p. 231.

[3]Mayer: Deutsch. Viertelj. f. öffentl. Ges., 1913, 45, p. 12.

[4]Proc. Physiological Soc., March 20, 1926, p. xxiv. (Bound in Jour. of Physiology, 1926, *61*.)

substances as, for example, a substance in cereals interfering with calcification. Another type of harmful substance is thought to be present in wheat germ. This substance produces severe nervous symptoms. From this point of view vitamins may be supposed to exercise an antidotal or counteracting effect upon the natural poisons present in widely used food stuffs. These hypothetical toxic substances in natural food, like vitamins, are thus far known only by their physiological effects.

Poisoning from eating normal animal tissues does not seem to be so common as from plants, and less is known about the specific poisonous constituents. Several varieties of fish, notably certain tropical species, are quite poisonous. The famous Japanese Fugu, one of the balloon fish, has been the cause of numerous deaths and has been often utilized for suicidal purposes.

Besides the foregoing instances of poisoning due either to toxic substances in healthy undecomposed plant and animal tissue or to a peculiar sensitive condition in a few individuals, other and more generally significant factors affecting the safety and wholesomeness of food are today matters of much concern to public health workers. These are: (1) accidental introduction of poisonous substances into food during growth, manufacture or preservation; (2) intentional addition of preservatives to food; (3) contamination with pathogenic microbes through the agency of convalescents or germ carriers engaged in the preparation, transportation or serving of food; (4) infection with microbes or intoxication with the products of microbes present in the bodies of food animals; (5) the deleterious action of poisonous substances formed in partly spoiled or decomposed food.

(1) *Accidental Introduction of Poisonous Substances into Food.* Even so powerful a poison as arsenic may find its way into widely used food substances. A recent instance is the arsenical poisoning due to cocoa prepared by a well known English firm. On investigation, the potassium carbonate used to make the cocoa more soluble was discovered to contain considerable quantities of arsenic, so that the marketed product showed one tenth of a grain of arsenic to a pound of cocoa. In Germany potash that had been used in making Pfefferkuchen was recently found to contain arsenic. In this case the arsenic was attributed to potash manufactured from the wool fat of sheep that had been treated with arsenic-containing mixture to prevent scab. In 1900 an extensive epidemic of "peripheral neuritis" in the English Midlands was traced to the presence of dangerous quantities of arsenic in beer; investigation showed that the brewing sugars contained arsenic derived from the sulphuric acid used in their preparation. Food exposed to the gases arising from the combustion of certain coals may likewise be impregnated with arsenic. In these instances the source of the arsenic is the same,—the iron pyrites, practic-

ally always arsenical, contained in the coal or used in the manufacture of the sulphuric acid. Since this danger became known, great care has been exercised to insure that the sulphuric acid used in making glucose shall be arsenic-free, and there is probably little cause to apprehend serious trouble from this source, although constant watchfulness is of course necessary. Still more recently considerable uneasiness has been expressed over the possibility of arsenic poisoning from fruit that has been sprayed with insecticides. The almost universal use of arsenicals in sprays for apples and other fruit trees and the fact that the presence of arsenic has been demonstrated on the skin and in the calyx of ripened apples shipped to foreign countries have been used as arguments for placing a ban on sprayed fruits. Caseinates are used extensively in sprays as a means of inducing adhesion, so that it is difficult to free apples from the arsenical deposit. We know little or nothing about the effect on children or on weakened adults of even such small quantities of arsenic as may be present on sprayed apples, and the question should be investigated with an open mind. As yet the reported cases of poisoning from this cause do not seem to be either numerous or severe. It may well be that the lead which is also a usual ingredient of the insecticidal sprays (lead arsenate) is more of a menace than the arsenic.

Lead is, of course, a familiar and dangerous poison, but apart from lead hazards in industry, there is much less likelihood of lead getting into food and drink than there was some years ago. One of the earliest (1767) epidemiological investigations—that upon the famous Devonshire colic due to the action of cider on lead containers—was not without its lesson, and today lead poisoning except in certain trades is a comparative rarity. The use of lead service pipes for water supplies has been largely abandoned, and the lead glazes once commonly used in enameled cooking dishes are now rarely employed. Soluble lead glazes if used are, however, undoubtedly dangerous. The recent study by Monier-Williams for the British Ministry of Health showed that prolonged action of citric acid on lead-glazed cooking ware, mostly imported from France, resulted under certain conditions in a marked degree of contamination. The particular enamel employed in the cooking ware so widely used at present in the United States is lead-free, and is probably quite safe. Monier-Williams considers that "the probability that undesirable constituents in significant amounts may be dissolved from enamel hollow ware during the ordinary processes of cooking may be regarded as remote."[1]

The great modern development in the consumption of canned foods has caused alarm to be expressed lest tin poisoning might result from

[1]Reports of Public Health and Medical Subjects No. 29, Ministry of Health, London, 1925.

corrosive action upon the tin of the container. It is well established that tin may be dissolved by acid fruits and berries and by certain vegetables. Definitely traced cases of tin poisoning due to this cause are, however, very few in number, and most sanitariums who have investigated the matter agree with Lehmann[1] that the amounts of tin ordinarily present in canned foods are not of sanitary significance. The increasing employment of lacquered or enamel-lined cans for those fruits and vegetables especially liable to attack tin has probably reduced this danger to a minimum.

On the other hand, prolonged and frequent contact of copper with food and drink must be looked upon with concern. Recent physiological and pathological studies upon the effect of the frequent ingestion of small amounts of copper have yielded findings that are far from reassuring. The observations of Mallory[2] on hemochromatosis have shown that the addition of acetate of copper to the food of rabbits produced pigment cirrhosis in from three to twelve months. From clinical studies it appears that many patients with hemochromatosis give a history either of industrial exposure to copper or of prolonged alcoholic excess. It seems possible that the pigment cirrhosis often attributed to alcohol may be due to the copper content of the alcoholic beverage. When copper is employed for the worm of the condenser used in distilling liquor, the organic acids in the mash which distil over with the alcohol are able to act on the copper, and it is not surprising that copper has been found in various samples of distilled liquor in amounts varying from a trace up to 185 mg. per liter. A quart of whiskey a day containing the latter amount would entail the ingestion of over a pound of copper in the course of 10 years, and is certainly a dangerous ration. The contact of copper with foods or drinks, particularly with those of an acid reaction, is by all means to be avoided. The employment of copper sulphate to color canned peas, string beans or other green vegetables should be prohibited generally, as it is now in Denmark, the United States and recently Great Britain.

On the whole, it is probably true that the accidental or incidental contamination of food with poisonous metallic substances is not increasing at the present time. The ordinary sources of danger are today fairly well known, and adequate precautions are being taken voluntarily or are prescribed by official regulation. New difficulties may arise, as exemplified in the case of sprayed fruit, and wherever the human element is involved we shall always have to reckon with stupidity and carelessness. As a public health problem, however, this aspect of food poisoning is better in hand than some of those to be presently considered.

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[1]Arch. f. Hyg., 1907, 63, p. 67.
[2]Arch. Int. Med., 1926, 37, p. 336.

(2) *Food Preservatives.* From time immemorial the human race has been confronted with the need of carrying over food from a period of superabundance to a period of scarcity. Primitive methods of drying, smoking and salting have been largely supplemented by modern methods of refrigeration and canning. The deliberate addition of chemical substances to food for the purpose of impeding or preventing spoilage is liable to abuse. Since food spoils because of microbic action the preservative substances must be of a kind and amount to restrict bacterial development; hence they partake of the nature of general protoplasmic poisons. Unfortunately, it is not easy—witness the laborious experiments of chemotherapy—to find utilizable substances which are injurious to bacteria without being injurious to man. Even so, we cannot be unmindful of the force of the argument that enormous quantities of wholesome foods are now wasted by spoilage and that a really harmless food preservative is much to be desired on economic grounds.

The whole matter of chemical preservatives in food is highly complicated and the diverse opinions held demonstrate the incompleteness of our knowledge. The preservative powers of a briny solution of common salt are well known; small amounts of salt are absolutely necessary to health; large doses may be poisonous. Smoked meats and fish owe their keeping qualities to the presence of creosote and similar substances; creosote is more poisonous than some other chemical preservatives over which much controversy has raged, yet little if any hygienic objection has been offered to the use of smoked foods. It does not follow that the frequent partaking of food impregnated with creosote may not be fraught with injurious consequences.

With respect to more vehemently discussed preservatives, sanitary opinion has gradually crystallized to the conviction that the deliberate addition of formed chemical poisons to food should be reduced to a minimum. The present conditions of commercial competition make it a great temptation for purveyors of food to avoid loss from spoilage. The easiest and least expensive way to do this is to add what seems to the average food-handler an extremely small quantity of some preservative. Some of these substances have been sold broadcast under such alluring names as "freezaline", "preservaline", etc. The use for this purpose of certain chemicals such as formaldehyde, salicylic acid and sulphurous acid is now prohibited by law in most civilized countries. These compounds are definitely poisonous in relatively small amounts and their injurious action in minute successive doses in animal experiments is quite marked. More debate has occurred about the use of such preservatives as boric and benzoic acids. Benzoic acid, in particular, is present naturally in many fruits and berries, notably cranberries, and while itself poisonous is converted into harmless hippuric acid when taken into the body. Neverthe-

less, while evidence of harm is lacking, human experiments extending over a sufficiently prolonged period and under suitably varied conditions are necessary for a competent judgment even in this most favorable instance. One unfortunate aspect of the unrestricted use of chemical preservatives is the practical difficulty of controlling the amount added. Savage[1] relates that he found as much as 96 grains of boric acid per pound of brawn in one sample examined, and the brawn-maker, when invited to explain, stated that since the weather was rather hot he had mixed in a small handful of the boric acid as if it were so much common salt!

While the whole topic of food preservation is far too complicated to be dealt with adequately here, it seems justifiable to conclude that pending further definite experimental evidence of the effect on man of long-continued ingestion of even the preservatives apparently most harmless, the following procedure is warranted: (1) the use of chemical preservatives in food should be restricted as far as possible and limited at most to a few specified substances such as benzoic acid and its compounds; (2) the use of certain substances such as formaldehyde, sulphurous acid and sodium fluoride should be prohibited; (3) the permissible proportion of any authorized preservative should be prescribed by law, and all food containing preservatives (apart from salt, sugar and other listed substances) should be labeled with the kind and amount of preservative it contains.

(3) *Food Borne Infections.* In the modern world fewer and fewer families use food that they themselves have produced. Food today is ordinarily brought to the consumer from great distances and on its way is handled by many people unacquainted with the most elementary bacteriological technique. Fortunately the life of most pathogenic microbes outside the human body is brief, otherwise infection due to food handling would be much more common that it actually is. Even so, the list of food borne infections is a formidable one. Typhoid fever, the paratyphoid fevers A and B, Asiatic cholera, diphtheria, scarlet fever, septic sore throat and even, recently, acute poliomyelitis have all been traced to the contamination of food by human agency. As might be expected, milk—highly nutritious for microbes as well as man—is the vehicle in many cases, but numerous other foods have been implicated, particularly those commonly consumed uncooked. A remarkable instance of a food borne scarlet fever outbreak in three Massachusetts towns has lately been reported.[2] The epidemic was traced to the lobster meat in a lobster salad served by the same caterer at "banquets" in Weymouth, Lynn and Salem.

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[1]"Food Poisoning and Food Infection". Cambridge, England, 1920, p. 207.

[2]Scammon, C. L., Lombard, H. L., Beehler, Edith A., Lawson, G. M.: Am. Jour. Pub. Health, 1927, 17, p. 311.

Oysters and other shellfish, celery, lettuce, watercress and similar foods which may come in contact with sewage polluted water or other source of contamination and then are eaten without adequate purification have been shown by more or less convincing evidence to give rise to typhoid infection. In large cities the danger of milk borne infection has been almost entirely done away with by the practice of pasteurization; the relatively higher incidence of typhoid at the present time in smaller communities is probably due in large part to the proportionally greater use of raw milk. The oyster industry has recently been subjected to special overhauling following serious outbreaks of typhoid attributed to oysters in New York, Chicago and other large cities in the United States. Control measures have been instituted by State and Federal agencies with the complete cooperation of the oyster dealers and it is believed that effective safeguards can be, and in a considerable degree have been, established. The attempt to form a judgment as to the sanitary quality of shellfish merely by the "shellfish score", that is the relative number of B. coli, seems to me unwise and likely to lead to erroneous decisions. The interpretation of the shellfish score can only be made properly with a full knowledge of the sources and history of the shellfish. Direct inspection and supervision of the oyster beds themselves must, I believe, be our main reliance in preventing oyster contamination.

The likelihood of occasional food contamination conveyed from the hands of typhoid or other germ carriers engaged in preparing or serving food is too familiar to call for extended comment. Difficult administratively as is the control of typhoid carriers, the outlook on the whole is distinctly hopeful. The effect of our preventive measures is cumulative. As typhoid decreases, the number of carriers automatically diminishes. In the United States, we are manufacturing only one-tenth the number of typhoid carriers that we were two or three decades ago. The carrier problem is bound to become less serious.

Great strides too have been made in the matter of general cleanliness in food handling. The traditional peck of dirt which as children we were told appallingly that sooner or later we should have to eat has shrunk to manageable dimensions. The civilized races have—perhaps rather suddenly—grown fastidious. We no longer view with equanimity the tossing of loaves of bread from street wagons by one dirty hand to another. We are not indifferent to flies in the restaurant milk pitcher or to the saliva-moistened fingers of handlers of bakery goods. Street dust, now that our imagination correctly pictures its composition, is no longer viewed as a necessary garnishment of food stalls. It is well sometimes to remember that part of the increased cost of our food at the present day is the price we are paying for increased cleanliness and for increased safety from food

borne infections. Pasteurized milk and wrapped bread are worth more than the same foods laden with intestinal microbes.

(4) *The Relation of Animal Infections to Food Poisoning in Man.* A particularly interesting and significant phase of the food poisoning problem concerns the connection between various animal infections and certain human food borne infections or intoxications. Well known diseases of the domestic animals, such as tuberculosis and foot-and-mouth disease of cattle, are sometimes transmitted to man, notably by the medium of milk. Here also the pasteurization of milk constitutes an invaluable safeguard. One class of animal diseases is especially conspicuous in its relation to human food poisoning. This is the group of paratyphoid-enteritidis infections. Many animal species are liable to attack. Cattle, sheep, horses, swine, rabbits, guinea pigs, rats, mice—all suffer at times from infection with members of this group and are sometimes subject to great epidemics. Barnyard fowls such as chickens and ducks also have their paratyphoid diseases. The bacilli causing these infections are closely related to the typhoid bacillus, but may be readily distinguished by appropriate tests.[1] Most of the meat-poisoning outbreaks in Great Britain and Continental Europe have been traced to animal infections of this class. The symptoms are characteristically gastro-intestinal so that the diagnosis of "food poisoning" is naturally and commonly made. The discovery that meat-poisoning might be due to paratyphoid bacilli was made by Gärtner in 1888 in the investigation of an outbreak in the small German village of Frankenhausen. The outbreak was traced to the use of meat from a cow slaughtered because she was ill with a severe enteritis. Fifty-eight persons were affected; one died. Gärtner isolated from the spleen of the fatal case and also from the flesh and intestine of the cow a bacillus to which he gave the name B. enteritidis. Since that time numerous meat-poisoning outbreaks have been associated with the presence of organisms of this group.

(To be continued)

[1]Jordan, E. O.: Jour. Infec. Dis., 1917, 20, p. 457.

Protection Against Disease*

By Donald T. Fraser, B.A., M.B., D.P.H.,

Associate Professor, Dept of Hygiene, University of Toronto.

PASTEUR, some fifty years ago, was faced with this puzzle—why did some of his chickens, previously inoculated with old cultures of chicken cholera remain well when reinoculated with fresh cultures of virulent germs? True, the old cultures which had stood in the laboratory forgotten for some weeks had made the chickens sick, but they had soon completely recovered. How did these recovered chickens differ from the new, untreated ones which succumbed so rapidly to cholera? Why should the mere fact of recovery make them refractory to large doses of virulent germs? Here was something new, something that might, nay would, change the method of attack in the thrilling battle of man against disease. Chance, which is the ally only of those who have the genius of observation, prepared the way for this great discovery that pathogenic micro-organisms can be tamed, can have their virulence attenuated but still retain the power of stimulating animals to produce protective substances. This protection possessed by the animal against the invasion of pathogenic or disease-producing micro-organisms is called immunity.

This new conception, attenuation of germs, led Pasteur to apply the principle to the study of the experimental prevention of anthrax. The problem, in contrast to that of chicken cholera, was fraught with great technical difficulty. The bacillus of anthrax is very virulent and moreover, in the course of its life cycle, develops spores which are extremely resistant to heat, to drying, and other physical agents which readily kill vegetable forms of micro-organisms.

Hardly had the laboratory experiments been completed when Pasteur was called upon, virtually challenged, by Rossignol to demonstrate publicly the efficiency of the vaccine, as the attenuated culture was called, in protecting animals against anthrax. No more dogmatic and at the same time hazardous demonstration has ever been staged than that at the farm of Pouilly-le-fort. The scientific life of Pasteur was at stake. "These experiments are solemn ones and they will become memorable, if as M. Pasteur asserts with such confidence, they confirm all those he has already

*Reprinted from *The Canadian Forum*, July, 1927.

instituted . . . Let M. Pasteur not forget that the Tarpeian Rock is near the Capitol." These were the words with which Rossignol ended his prophetic editorial notice in the Veterinary Press. The animals for this critical experiment had been divided into two groups—one treated with attenuated anthrax bacilli, or anthrax vaccine, the other untreated and serving as controls. Fourteen days after the last injection all the animals of each group were inoculated with a fully virulent culture known to kill unprotected animals. Two days later the twenty-four untreated sheep were dead; the vaccinated animals had not so much as a trace of fever. Pasteur's triumph was immediate and complete.

The application of the same idea, attenuation of virus, after years of ceaseless experimentation, bore fruit in Pasteur's dramatic discovery of the means for the prevention of rabies.

What is the fundamental scientific significance of these achievements? The results of Pasteur's experiments mark the beginning of one of the newest of the biological sciences, Immunology, or the study of the resistance of the host to the invasion of pathogenic micro-organisms.

The experiments of Pasteur had demonstrated that immunity to a pathogenic micro-organism could be conferred upon an animal by the inoculation of an attenuated or changed culture without causing more than a transient and harmless reaction upon the animal thus protected. In response to this stimulus the body cells of the injected animal have themselves produced or taken on the quality of increased resistance. This method of protection is spoken of as *active immunization* in contrast to *passive immunization.* By the latter is meant *the transference of the serum of an actively immunized animal* to *another which thereby in turn becomes protected.* A familiar illustration is the injection into a human being of diphtheria antitoxin or tetanus antitoxin produced by a horse in response to methods of active immunization. The horse has done the work; the person receives the protective substance contained in the serum, passively. The *active immunity acquired by an attack of certain diseases* or by an *artificial inoculation of attenuated micro-organisms,* or their products, *is frequently of long duration, even life-long.* In sharp contrast to this is the *ephemeral protection afforded by passive immunization.* The development of active immunity furthermore takes time; passive immunity is conferred almost immediately. *Active immunity,* from the *point of view* of *defence,* is a *barbed wire entanglement which requires considerable bombardment to demolish; passive immunity* is a *smoke screen, extremely useful in an emergency but soon dissipated*: or, active immunity is a stoutly fashioned armour; passive immunity is an effective but evanescent magic charm.

Pasteur in his enthusiasm over his discovery of the principle under-

lying the vaccination of chickens against cholera, a principle destined to guide and determine the activities and destinies of civilized mankind, wrote of his doctrine:—"The breath of Truth is carrying it on to the fruitful fields of the future."

What of these fruitful fields? Roux, the brilliant pupil of Pasteur, and Yersin, the discoverer of the germ of plague, set out to find the poison of the diphtheria bacillus. This poison was finally demonstrated by them. Further, if the broth in which the germs were growing was passed through unglazed porcelain filters the toxin could be made germ-free. It is by virtue of this toxin that the disease diphtheria manifests its murderous effects upon man. This was the first demonstration of the fact that a product of a pathogenic micro-organism could in itself exert a specific effect. It is not the germ that harms; it is the powerful soluble substance which it produces. One eight-hundredth of a cubic centimeter of this toxin could kill a guinea pig. Von Behring established in 1887 the fact that this toxin, when injected into animals in suitable amounts, stimulated the production of a protective toxin-neutralizing substance which he called antitoxin. It remained for Roux to produce diphtheria antitoxin on a large scale by the use of horses. It was Roux also who demonstrated its clinical value at the hospital of Enfants Malades in Paris. Ramon, of the Institut Pasteur, showed in 1923 how this toxin, by the addition of one-half per cent. formaldehyde, could be attenuated so that five thousand times the previous lethal dose does not even harm a guinea pig. It still possesses, however, the power of producing active immunity in animals and man; that is, it is still antigenic, to use a technical term. The more powerful toxin of the bacillus of tetanus has also been rendered non-toxic. Ramon has very recently actively immunized his own children with it. The newest development in the application of the principles disclosed by Pasteur's researches is in regard to scarlet fever. The germ of this disease will also produce a toxin which, like diphtheria toxin, can be separated from the micro-organism which produces it. A drop of it when much diluted and introduced into the skin will distinguish those who are immune to scarlet fever from those who are susceptible. In this test redness develops if there is not enough scarlet fever antitoxin present in the body to neutralize the toxin injected. Unlike the products of the bacillus of tetanus and of diphtheria, which are able to kill laboratory animals in extremely minute quantities, the soluble substance, or toxin of the scarlet fever germ is non-lethal to all laboratory animals tested. Hence it is that the skin of man, and some species of goat, is made use of in determining the potency of the toxin and the antitoxin. Intelligently used, the toxin is a safe and effective means of producing active immunity against scarlet fever in man.

The chemical nature of antigens, the stimulating substance, and of antibodies, the result of that stimulus, is known. That they are protein is generally accepted. Antigen stimulus and antibody response are the two measurable qualities with which the immunologist must work. An analysis of these substances is an extremely difficult matter because of imperfect methods of their isolation and the fact that they are frequently labile, and generally accompanied by, inert impurities. It is for structural organic chemistry, colloidal chemistry, and physical chemistry to elucidate the problem of the chemical composition of the substances concerned in the phenomena of immunity.

A fascinating problem awaiting solution is that of the origin in the body of these protective substances. Which organ or tissue manufactures antitoxin? Many ingenious experiments have been carried out in an attempt to find the answer, but none has proved altogether satisfactory.

There are, of course, many defensive mechanisms of the body other than the production of antitoxin. Some of these are still less clearly understood. There is for example, the ability of the white blood cells or leucocytes and other formed cells of the body to digest and dispose of bacteria. This phenomenon, called phagocytosis, was revealed by the brilliant researches of Metchnikoff.

As Sir George Newman has said, "We are in the golden age of Medicine." Greater treasures still await our discovery. Antitoxins, vaccines, and attenuated viruses are new medicines for the cure and prevention of disease. They are Nature's own medicines because they are Nature's adjuncts to the combating of disease. It is to Pasteur we owe the incalculable debt of gratitude for showing us the path we have followed and must continue to follow. But the jig-saw puzzle that faced Pasteur in 1880, though still unsolved and unfinished, shows little patterns here and there already pieced together. The vision of the final pattern of the whole is far distant—as far distant as that of science itself.

The Social Hygiene Council*

By Dr. Gordon Bates
General Secretary, Canadian Social Hygiene Council

MAY I first of all express my appreciation of the remarks of both Dr. Robertson and Mr. Finlayson. When Mr. Finlayson said that we have the opportunity in Canada of applying the remedy at the roots when considering ill-health, he was more than right. I would go further than that and say that if we are to build up a fine, healthy nation in Canada, we *must* apply the remedy at the roots.

I am anxious to achieve very briefly and very concisely a specific task. To first of all give you some facts as to the possibilities in connection with the conservation of life and health—and incidentally the reduction of mortality rates—and secondly, to describe to you the development of a specific plan which I hope will meet with your approval.

My own interest in the subject originated when as an examiner for the Canada Life I saw something of the value of the medical examination —not only as a service to the Life Insurance Company but also as a means of impressing applicants especially those rejected with the necessity for looking after their own health. The resultant action has many a time meant the prolongation of a life and hence a service to the individual and to the country. The re-examination of applicants some years after their first examination impressed me with another fact that frequently incipient disease which developed after a first examination was made, developed into a serious condition, which, while it rendered the applicant unacceptable for a new policy, might mean the loss of life to the policyholder and the unnecessarily early payment of the full amount of the policy on the part of the company. I think that probably all of you can think of instances of this sort. The other day I saw two men waiting in a doctor's office both of whom were absolutely non-insurable. The one had locomotor ataxia and the other heart-disease. Between them they held policies amounting to $125,000.00

The loss not only to insurance companies but to the country because of unnecessary illness and death is astonishingly large, so large indeed that it seems to me to be amazing that our governments have not taken cognizance of it earlier.

Recently through the Canadian Social Hygiene Council I have had

*Address before the Canadian Life Insurance Officers Association.

the opportunity of looking into conditions in Canada. Over a period of months we put a special investigator at work and as a result, basing our conclusions partly on an application of the statistics of Dr. Dublin of the Metropolitan Life Insurance Company and partly by using the information we were able to obtain through investigating Canadian sources, we came to the conclusion that approximately 180,000 persons in the Dominion are constantly suffering from disabling illness and that in the province of Ontario about 34 per cent. of our deaths are at least postponable.

The cost of this condition of affairs is enormous. I need not here go into the number of hospital, asylum and sanitarium beds which are unnecessarily occupied or the indirect social results. We have estimated that the cost of illness alone in Canada is $270,000,000 yearly and that the total cost of preventable illness and death is not much short of half a billion dollars yearly. A complete discussion of the preventability of such conditions would involve a history of preventive medicine covering the last fifty or sixty years. That mortality rates in any country can be reduced is obvious. May I recall for your consideration the statement of Professor Irving Fisher of Yale, to the effect that in the 17th and 18th centuries the duration of human life was increased at the rate of four years per century, in the first three quarters of the last century at the rate of nine years per century, in the final quarter at the rate of fourteen years per century, in the first twenty-five years of the present century in England, United States and Germany at the rate of 40 years per century.

In 1840, the average duration of life in the United States, and presumably in this province, was 40 years. At the present time it is 58. In New Zealand it is 65. The extent to which human life may be prolonged is problematic. Certainly 70 years is by no means the limit. Fisher's estimate that 100 years may be achieved in a comparatively short time is interesting, without attempting to peer into the future further than that.

There is not time on this occasion to attempt to describe in detail the means whereby the success to date has been achieved, beyond saying that the application of scientific methods based largely on the discoveries of Pasteur and Lister has been responsible and that mortality rates have been reduced particularly in the earlier ages. The growth of public opinion, the establishment of Health Departments, etc., has had much to do with this.

I have now to briefly describe for you something of the plans of the Canadian Social Hygiene Council for elaborating a scheme which has been under development for several years.

This organization came into being in 1920, under the auspices of the Dominion Government. It was formed originally with the idea of keeping public opinion behind the first co-operative health scheme entered into by the Dominion Government with the provinces. This plan involved the

expenditure of as much as $400,000.00 per year between the Dominion and the provinces and has resulted in the reporting of nearly 200,000 persons suffering from venereal disease as having been brought under treatment.

The Social Hygiene Council which undertook the education and propaganda part of the scheme by means of the moving-picture, the lecturer, the newspaper article, etc., managed to attract a good deal of attention to the scheme, the general machinery of which is still intact as a result.

It is impossible here to give you in detail the far-reaching results of this. The fact that various recent reports show a reduction in the percentage of syphilis, a killing and disabling disease, in certain institutions is significant. In Toronto General Hospital the percentage has fallen from thirteen per cent. to under five per cent., in the general wards; in the Hospital for Sick Children, Toronto, it has been reduced to less than one per cent.

It was soon found, however, that the immediately necessary public education was so closely related to other types of health education that all should be carried on simultaneously and now for some years the branches of the Council have attempted to render service to health officials by undertaking whatever type of education is required.

There are many directions in which the organizing of public opinion behind our health officials will always be necessary. I need only cite the constant difficulty in controlling smallpox, the result largely of either uneducated public opinion or public opinion so moulded by the anti-vaccinationist and others of his ilk that it hinders rather than helps. But there are other directions in which public opinion is necessary. In the absence of sound public opinion health departments are likely to be weak—generally with disastrous results. I need only cite the Montreal typhoid epidemic. It would appear that in rural districts mortality rates are likely to be high because of the apparent expense of full time health units. Such units can only be obtained if we have public education and hence public opinion in favour of such expense. A plan which is essential to health progress is the periodic health examination plan—such to be carried out by the family physician. Obviously, if we are attempting to improve the health of the entire Dominion, no staff short of all of the physicians in the country will suffice. Only by such a plan can incipient disease throughout the country be detected and dealt with early. I would point out that a standard form has already been prepared by the Canadian Medical Association with which body the Social Hygiene Council is affiliated and the Social Hygiene Council in co-operation with other organizations is prepared to undertake public education at the earliest possible moment.

The Social Hygiene Council has carried on for some years gradually

increasing its scope and its influence. From the beginning, government support and co-operation has been evident and there is a growing body of popular support. I should add here that most welcome and effective support has been rendered by the Metropolitan Life Insurance Company which contributes $15,000.00 per year. The affairs of the organization are handled by a Board (Chairman, Mr. Justice Riddell) which includes most of the chief Health Officials of the Dominion. A growing Advisory Board headed by Sir Arthur Currie, now includes some of our most eminent Canadians, among whom I may mention Mr. H. C. Cox, Mr. T. B. Macaulay, Mr. A. F. C. Fiske, Mr. E. W. Beatty, Mr. E. R. Wood, Mr. C. C. Ferguson, Mr. C. S. Macdonald, Mr. T. G. McConkey and many others known to you.

Lately the Council has decided to embark on a carefully developed, but much more elaborate programme than in the past. The value of the lecturer, the exhibit, the moving-picture has been realized—also the newspaper article. I may say we are now supplying health articles to some 900 newspapers—but it is also realized that to attempt to influence conditions among 10,000,000 people a fairly elaborate machinery is necessary. It has been decided that this machinery—which will involve units in the various provinces and supplies of all sorts of exhibit material, moving-pictures and moving-picture machines, secretaries, travelling expenses, etc., will involve the expenditure of approximately $543,000 over a period of three years.

I cannot here describe all of the proposed activities of the organization except to sum them up by the term education—and it seems to me that upon this depends the whole future of public health.

Prevention of Rabies Infection

C. M. Anderson, M.D.
Director of Laboratories, Department of Health of Ontario

Rabies is one of the most ancient and widespread disorders which affects both man and animals. It is an infectious or communicable disease in exactly the same sense that diphtheria and scarlet fever are communicable. That is, it never arises spontaneously but is always transmitted through the saliva of an infected animal.

For a number of years previous to 1925, Ontario was practically free of rabies. During that year the disease was introduced into the Province of Quebec by a party of American hunters bringing in dogs from an infected region in the United States. It was not long before the disease had spread Southward through the Eastern counties of Ontario. Since that time further importations of dogs from the United States have been followed by further outbreaks of rabies, particularly in Western and Central Ontario. It would therefore be well for physicians and veterinarians to be on the lookout for this disease and to take the proper steps to prevent its dissemination and particularly its spread to man.

Course of the Disease

All warm blooded animals are susceptible to rabies infection. The dog is most frequently affected and has in all probability been responsible for the perpetuation of the disease from the earliest centuries.

The incubation period in either man or animals may be as short as fourteen days or as long as seven or eight months, depending upon the part of the body into which the virus is introduced and the virulence and amount of virus admitted. As the virus reaches the brain by means of the nerves, it is to be expected that the disease would develop most rapidly following bites about the head. The vast majority of cases of rabies in animals develop within sixty days from the date the virus was implanted in the wound.

Following the period of incubation, infection becomes manifest by a sudden change in disposition. The disease then follows a rapidly fatal course from a stage of stimulation and excitement to that of depression and paralysis, usually ending in death in three or four days.

Prevention of the Disease in Animals

The disease has been kept out of Great Britain by a system of isolating, for three months, all dogs brought into that Country. When the disease is found in a community its spread can only be prevented by efficient muzzling of all dogs and the destruction of all stray and ownerless animals. To have this carried out effectively, it is advisable to appoint an official dog-catcher and preferably one who is not a local resident so that he may be free to act without fear or favour.

The Procedure to be Followed With Dog Bites

The following detailed information should be immediately obtained:

1. Name and address of owner of suspected animal.
2. Names and addresses of all persons bitten, scratched or licked by such animal.
3. Date of occurrence.
4. Location of wound, *e.g.*, face, hand, etc.

The above record should be passed to the local Medical Officer of Health who will see that the animal is secured and proper action taken to prevent the spread of the disease.

Owing to the rapidly fatal course of rabies in animals it is always advisable to secure an animal that has bitten anyone and to keep it under observation for a period of ten days, during which time if it is suffering from rabies it will show undoubted signs of the disease and will be dead before the expiration of the ten-day period. If this happens, the head should be severed from the body, packed in ice and shipped to the Provnicial Laboratories, Toronto, for confirmation of the diagnosis. If the dog is alive and well at the end of ten days the person bitten may rest assured that he was not bitten by a "Mad Dog."

It cannot be too strongly emphasized that *when the symptoms or actions of an animal are suspicious, immunization should be begun without delay.*

If the dog has been inadvertently killed after biting somebody it is very difficult to disprove the possibility of rabies infection in the animal on account of the fact that in the very early stages the Negri bodies characteristic of this disease may be so small as to be missed in the microscopic examination of the brain tissue. In such cases the vaccine should be administered if the symptoms shown by the animal previous to its death were at all suspicious of rabies. To make a satisfactory laboratory diagnosis then, we must have the whole uninjured and fresh brain from an animal whose disease has been allowed to run its course to a fatal termination.

On account of the short incubation period following bites about the head it is advisable to begin immunization as soon as possible and to carry out the other procedures until it is proven that the dog is not suffering from rabies infection.

Treatment of Wounds

The ordinary disinfectants applied to wounds such as tincture of iodine and hydrogen peroxide are not effective in penetrating deeply into the wound to destroy the virus. Pure nitric acid should be carefully applied to all parts of the wound by means of a glass rod as soon as possible after the bite has been inflicted. If nitric acid is not available, caustic soda in its pure form should be used. This applies even to bites about the face if there is any suspicion of the dog being infected with rabies. Such treatment should of course be carried out by a qualified physician.

Rabies Prophylactic Vaccine

The rabies vaccine now employed is prepared by the Semple method. It differs from Pasteur's original method in that a killed virus is now used, experimental work having proven that a phenolized brain emulsion might be used instead of the attenuated virus originally recommended.

The dose is 2 cc.'s daily for either an adult or a child, the volume and strength of the vaccine remaining the same for each of the fourteen doses. In bites about the face it is considered advisable to prolong the course to twenty-one days. Detailed directions for the use of rabies vaccine is sent out with each package. The Department supplies the vaccine free to any qualified physician in the Province. If the physician prefers to have the vaccine put up in syringe containers he must enclose with the requisition a cheque or money order for $2.00 to cover the cost of the syringes.

The vaccine may be obtained by telephone, telegram, or mail, depending upon the urgency of the case. The following information is essential:

1. Name of person bitten.
2. Location and date of bite.
3. Whether the animal has died or is being held for observation; and if animal has died whether the head is being sent to the laboratories of the Department.

Further information may be obtained from the Department of Health of Ontario, Parliament Buildings, Toronto.

Diphtheria

A Popular Health Article

Editor's Note:—The article reproduced below has been prepared by the Canadian Social Hygiene Council for use in newspapers in the hope that it may be of value in assisting Departments of Health in their efforts to control Diphtheria. It will be circulated shortly in the Province of Ontario with the authority of the Provincial Department of Health. It may be used by any health department in any of the provinces and it is suggested that health officers who desire its publication in their local newspapers approach local editors. Copies of the article may be secured on application to The Public Health Journal.

It was Dr. C. J. O. Hastings of Toronto, dean of America's public health officers and a man with a remarkable series of triumphs over disease to his credit, who said that every time there was a death from diphtheria, the coroner should investigate it.

His declaration was endorsed by other medical men in all parts of the continent.

Dr. Hastings' statement was based on the fact that science has already provided the human race with two methods of coping with this scourge—first, the means of complete protection against the disease, toxoid, and secondly, the treatment, antitoxin.

Yet, in spite of this means of fighting diphtheria, its death toll continues and young lives are regularly sacrificed to it.

Before going into this aspect of the question, however, some accurate data regarding diphtheria itself is necessary.

It chiefly attacks children under ten years of age and is much more fatal in young children than in older persons, most deaths from it occurring among victims under five years of age.

Records show that it is most common between November and January and that cases decrease till it is at a minimum from June till August. It is usually more prevalent in cities than in the country and negroes seem less susceptible to it than whites.

When physicians first began to study it, the disease was somewhat of a puzzle to them. It was obvious that the throat was, as a general rule, the original site of the disease. Yet it often caused serious damage to tissues of the body quite distant from the seat of the infection.

Frederick Loeffler, a German, was the discoverer of the actual germ which is the cause. He proved, beyond dispute, that his findings were

correct but he could not answer all questions connected with the action of the disease.

He searched through other parts of the body and in the blood for germs and never found any except in the nose or throat. He came to the conclusion, therefore, that the germs of diphtheria must give off a deadly poison which was distributed in the blood.

Then, a Frenchman, named Emile Roux, proved this definitely by putting diphtheria germs in a broth and then filtering the germs out after they had grown. The liquid which he had left, absolutely free of germs, would, nevertheless, cause diphtheria poisoning if injected into guinea-pigs.

Poisons, such as the ones diphtheria germs give off, are called toxins.

But, science soon made another interesting discovery. It was found that animals which had once recovered from diphtheria poisoning thereafter, were protected from the disease, or "immune" to it.

Medical men were not long in finding the reason for this. The body, affected with diphtheria poisoning, seeks to fight it off by producing a protective substance of its own. This counteracts the toxins produced by the diphtheria germ and is called antitoxin.

Investigating further, it was found that if animals were first given antitoxin and then injected with diphtheria germs, the germs did no harm whatever. It was also ascertained that an animal supposedly suffering from a fatal case of diphtheria, would recover if given antitoxin promptly.

Science, in the light of these facts, at once turned to the question of producing antitoxin in absolutely pure form and in large quantities. By 1896, the experimenting had been completed and antitoxin was ready for the doctor's use.

It must be remembered that antitoxin's chief value is as a treatment and, for that purpose, it is unexcelled.

But it can also be used, under certain conditions, as a preventive. If, for instance, one child in a household is stricken with diphtheria and the remaining children are not protected against it, the thing to use is antitoxin. It will give immediate protection, lasting from 28 to 30 days.

The action of toxoid is slower. What it does is to induce the body to produce its own protecting antitoxin, a lasting but necessarily a slower process.

In the past, from 25 to 40 per cent. of those who fell victims to diphtheria, died. Now, it can be said with certainty that in cases which are treated with antitoxin within the first two days, not one in fifty dies.

Time, however, is a most important factor and even hours count much. There is every chance of saving a child if the antitoxin is given at once.

Thirty hours after, hopes are considerably less. After three days, they are even further diminished.

To a doctor, who has actually seen the effect of this treatment, it is one of the most impressive things in the world, just as, in other days, the physician's inability to cope with this scourge was one of the most devastating experiences through which a medical man could go.

One man, whose practice extends back to the days before antitoxin became general, gives a vivid description of it:

"I recall the case of a beautiful girl of five or six years, the fourth child in a farmer's family to become the victim of diphtheria. She literally choked to death, remaining conscious till the last moment of life. Knowing the utter futility of the various methods which had been tried to get rid of the membrane in diphtheria or to combat the morbid condition, due, as we know now to the toxin, I felt as did every physician of that day, as if my hands were literally tied and I watched the death of that beautiful child feeling absolutely helpless to be of any assistance.

About ten years, thereafter, my own daughter became ill with diphtheria. She was just about the age of the little girl with whom I had had the early experience. A culture from the throat confirmed the diagnosis of diphtheria and the membrane from the fauces was extending down into the larynx. An injection of diphtheria antitoxin was given. To watch the choking dreadful membrane melt away and disappear in a few hours with complete restoration to health within a few days, was one of the most dramatic and thrilling experiences of my professional career."

All these details of the way in which medical science got at the real facts of diphtheria and the painstaking method by means of which an effective method of treating it, was found, are given here for particular reasons.

There has been a considerable amount of misinformation concerning the disease and some of it has been broadcast, generally. Articles have even appeared here and there, written glibly and with the appearance of being accurate, in which hot water bottles, blankets and restricted diet are given as an unfailing way of curing the disease, even among bad cases.

Knowing the exact nature of the scourge which the doctor is fighting when he is confronted with a case of diphtheria, these doctrines are more than fantastic and foolish. They are highly dangerous.

A typical one which has reached the Dominion was shown to an outstanding Canadian medical man.

"What would happen if someone tried to treat a child, critically ill with diphtheria, according to the methods described here?" he was asked.

It would be extremely dangerous and cause death in quite a percentage of cases.

But the great thing to remember in connection with diphtheria is that, in recent years, medical science has made another enormous stride forward. It is not necessary to-day for a child even to run the danger of contracting diphtheria.

By injections of "toxoid"—which is a chemically pure substance and incidentally, not a serum—a child can be protected, quite harmlessly and made immune to attacks from the disease.

Toxoid can be given to infants without the least irritation resulting and, in fact, should be administered before a child is one year of age to provide the most complete protection.

There are parents, however, who, while admitting the effectiveness of toxoid, point out that the total number of cases of diphtheria is not great and, through carelessness, neglect this safety precaution.

It is true that the total number of cases is not great but the total percentage of serious cases among those who do fall victims is very high. Diphtheria is a disease with which one cannot trifle.

It must be admitted that diphtheria epidemics as a rule don't run into scores of cases like epidemics from other diseases, and that the disease is a peculiarly selective one. It seems to strike here and there, first one place and then another, without any well-defined reason.

But the presence of the "diphtheria-carrier" is a tremendous argument in favour of the necessity of immunizing children with toxoid.

The number of children who have diphtheria germs in the nose and throat is many times as great as the number who actually develop diphtheria. Their presence is quite unknown and so common is this condition that it has been estimated that, in large city schools, from one-fourth to one-third of the children harbour virulent diphtheria germs during the course of a single year. This condition lasts, on the average, not more than two weeks.

But these "diphtheria-carriers" while the condition lasts may pass on the disease to their playmates and companions without anyone having any idea of how the disease was spread.

It is this fact which makes the use of toxoid so necessary, even if the plain common sense of the proceeding fails to impress one with its importance.

It is almost a matter of months and little more since the Canadian public began to wake up to the importance of the use of toxoid and to realize that universal use of it would completely wipe out this old-time terror of the household.

Now, we have the spectacle of whole classes of children being protected and groups of doctors and nurses, in large cities, immunizing hundreds of children against the disease.

The efficacy of the measure soon becomes apparent. Five years ago, toxoid was given to thousands of New York school children. By last year, that city's death rate from the disease had been reduced by 41 per cent. and 450 young lives are, therefore, being saved annually as a result.

Half a million New York children have now been protected and, in addition to the saving of lives, the total number of diphtheria cases has been cut down 34 per cent.

Statistics gathered from 70 American cities are also available and highly interesting. The two places where the diphtheria death rate was lowest—New Haven, Conn., and Youngstown, Ohio where, in each case, the rate was 0.6 per 100,000 of population—are both cities where there have been intensive campaigns for the use of toxoid among the children.

New Haven, for instance, with 36,000 school children has not had a single death from diphtheria during the past two school years. In the same length of time, there have been only 25 cases of the disease, 24 of which had never received as much as one dose of toxoid.

Brantford is one of the Canadian cities where toxoid has received great attention. The value of the procedure has been completely demonstrated there. A report from that city a few months ago, covering the preceding quarter-year, revealed the fact that there had not been a solitary case of diphtheria in the city during all that time.

Sunlight and Health

Radio Talk. Arranged by the Medical Society of Nova Scotia.
Station CHNS, Halifax.

W. H. HATTIE, M.D.

Professor of Hygiene and Public Health, Dalhousie University.

IT may seem odd for me to invite my first radio audience to come with me straight-away to gaol. Not to the Halifax city prison nor to any of the county gaols in Nova Scotia, for I have been in all of them many times, and cannot recommend any of them very highly—but to a gaol at such a distance as lends enchantment. I have borrowed the famed magic carpet for our adventure, for we must be transported backward in time to the year 1900, and forward in space to far off Java. On uttering the convenient word "presto" we are there at once—such is the advantage of magic—and find a Dutch physician named Eijkman in a state of great bewilderment because of the peculiar behaviour of a number of hens. He is using these hens in a laboratory study of a disease which is rife among the prisoners, but he cannot get on with his work because they develop most unexpected symptoms, become paralysed, and many of them die. Presently a change comes about, despite our careful avoidance of a repetition of "presto" which we are reserving for the home trip, and the surviving hens recover, and Eijkman is able to go on with his studies. But this is only for a few weeks. Then the hens sicken again, and Eijkman is driven to despair. Nothing in the experiments account for the phenomenon. How is it to be explained?

Eijkman now assumes the character of Sherlock Holmes, and weaves a web which soon enmeshes his laboratory boy and invests him in the habit of villainy. It is part of the boy's duty to feed the hens, and Eijkman has provided him with money for the purchase of the food. The boy has not profited by the horrible examples which the gaol affords, and allows cupidity to master conscience. He keeps the money and begs the prison steward to give him the refuse from the prisoner's table, mainly cooked polished rice, to feed to the hens. When the steward goes away for a time the boy must buy food and he procures unpolished rice—which is cheap. It is during this period that the hens recover. When the steward returns and the former fare is again provided, the hens once more sicken, become paralysed, and die.

Let us now say "presto" again, so that we may get back home and

deliberately consider the sequel in the past tense. In providing food for the hens, the boy provided food for Eijkman's thought. He noticed a striking similarity between the symptoms shown by the hens and the symptoms shown by the persons suffering from the disease called beri-beri. Investigation was immediately commenced which resulted in showing that beri-beri is not infectious, as previously thought, but is due to some peculiarity in food. Those who suffer from beri-beri were found to have lived mainly on polished rice. When unpolished rice was substituted, they usually made a rapid recovery. In this strange way studies were initiated which have brought to us our present knowledge of vitamins.

So much about the vitamins has been spoken "over the radio" and has appeared in popularly written articles that all who are now listening-in have doubtless a general knowledge of them, and know that they are mysterious substances which must be present in our food if health is to be maintained. They are of especial importance to babies and young children. One of them regulates the rate of growth, another prevents the development of rickets, still another prevents scurvy. There are others, but these three seem to be of greatest importance, and two of them are found in milk if the milk is produced under favourable conditions. But even the milk of a nursing mother may under certain circumstances be deficient in vitamins, and cow's milk is found to vary greatly in the quantity and variety of the vitamins it contains.

As might be expected, the study of the vitamins has enlisted many keen investigators in all parts of the world, but despite an immense amount of experimental investigation we are still without precise information relative to their origin, their composition or the means by which they exert their peculiar influences. There are, however, reasons for believing that at least some of their properties are to be explained in an amazing way. In order to make this clear, I must for a few minutes take you into the realm of the physicists.

It is generally believed that sound and light are both made sensible to us by waves in the æther. We speak of sound and light as travelling in waves. I am told that my voice is being carried to you in waves which measure 322 metres or nearly 360 yards from tip to tip. In wireless telegraphy waves are being used which are several miles in length. On the other hand "Millikan" rays given off by radium are so short that ten million millions of them extend over only a single inch. Physicists tell us that there are still many great gaps in their knowledge of the gamut of radiation. From time to time some gaps have been filled in, and doubtless the process of discovery will continue. Meantime we can only conjecture that new discoveries in this realm will disclose influences which are of definite concern to us. Certain determined wave lengths have long been known to have definite effects on our bodies, including the appreci-

ation of tones and colours, and there are doubtless many undetermined wave lengths which influence us in ways of which we are not conscious. It is only within comparatively recent years that we have come to recognize the importance of the ultra-violet rays, which travel in very short waves and do not affect us in a way of which we are made immediately conscious. We have known for some time that these rays destroy bacteria, brown our skins, and are very useful in the treatment of certain diseases. Some scientists now tell us that they are necessary to the production of at least some of the vitamins, and that such vitamins may almost be regarded as bottled-up ultra-violet rays.

To illustrate the possibility of this being a correct theory, let us consider the case of rickets—a disease of babies which can usually be prevented if the food used contains a certain vitamin. This vitamin is generally but not always present in cod liver oil. If cod liver oil does not contain it, exposure of the oil to sunlight or artificially produced ultra-violet rays will cause the vitamin to develop, and thus an oil which has been useless in rickets may be made quite effective. Now rickets is found especially in northern countries in the winter months when the days are short and when the babies do not get out of doors much. Sunlight will prevent the condition and will also cure it. The same is to be said of artificial ultra-violet rays. Moreover, during the winter months cattle that are kept indoors are found to produce milk which is deficient in the vitamin that prevents rickets. If such cattle are exposed for a few minutes daily to artificially generated ultra-violet rays, the vitamin reappears in their milk. A similar result follows if a nursing mother, whose milk is deficient in this vitamin, is treated to a short daily exposure to sunlight or artificial rays. Thus there are reasons for believing that the vitamin which prevents and cures rickets really bottles up the ultra-violet rays of the sunlight. And it may be that these rays are of service by aiding us in getting full value from our food.

This gives not only a partial explanation of the origin and action of at least one of the vitamins but also a partial explanation of the value of sunlight as a preservative of health. It is quite possible that rays which have not yet been fully studied may prove to be as valuable as the ultra-violet rays. Consequently, we should spend as much time as possible in the open air, and in the sun—where we may be sure of benefitting by all the different rays.

Ultra-violet rays cannot penetrate ordinary window glass, nor an atmosphere which is laden with particles of soot, dust, or moisture. During the winter, when the sun's rays come in a slanting direction and must therefore pass a greater distance through the atmosphere than when the sun is more nearly overhead, we are deprived of much of the sun's virtue. To offset this disadvantage we should be out of doors more in

winter than in summer. This is the more necessary because winter foods, including milk, contain less vitamins than summer foods. The extent to which we get sun-burned is an index of the benefit we derive from the sun.

As children, and especially babies, suffer more quickly from deprivation of vitamins than adults, it may be assumed that they need the direct action of the sun more than adults. Better results are obtained in children's hospitals which have windows of vita-glass, which the ultra violet rays can penetrate, than in hospitals glazed in the usual way. Artificial ultra-violet rays are also found to be of great assistance in such hospitals, as they are available at any time and can be resorted to on cloudy days. All this goes to prove the value of sunlight, and to show the wisdom of taking every possible advantage of it. On every bright winter day everyone, especially babies and children, should get out when the sun is at or near its highest point, for it is then that the ultra-violet rays are most likely to reach us.

We owe the beginning of studies which have brought us much valuable information to a bad boy, some martyred hens and Eijkman. We owe ourselves the practical application of that information to our own methods of living. Do we not read in Ecclesiastes that "the excellency of knowledge is that wisdom giveth life to them that have it?" This is surely enough for me to say.

Saskatchewan Health Officials' Association

RURAL HEALTH ORGANIZATION

Address by Dr. Arthur Wilson, President, Saskatchewan Health Officials' Association.

You will notice from your programme I have departed from the usual custom of a presidential address, chosen a title, "Rural Health Organization," and asked for a discussion. My reason for such conduct is that our time being exceedingly short, I wish to introduce the subject as briefly as possible and give others an opportunity to express their opinion freely before we go on with the rest of the programme.

The population of Saskatchewan is, for all practical purposes, rural, there being no city in the province of 50,000 people or more. In the United States cities of 50,000 persons or less are included in their county health districts for purposes of organization. In these days usually there is more sickness in rural communities than in urban communities. Communication between different parts of the Province is so easy that communicable diseases cannot be neglected in any one part without jeopardizing the safety of the rest of the Province. It is therefore important that whatever local organization is handling health work it should be as efficient as possible. The Provincial Department of Health exercises supervision through local health organizations over some 850,000 persons. They endeavour to educate the people and provide legislation, but the responsibility of enforcing their legislation is left largely in the hands of local health organizations which are the boards of health, with medical health officers appointed as executive officers. The municipal council is, by law, the board of health, and the composition may change annually. By the time a councillor has been associated with health work for a year or two, becoming a useful member of the board, he may step out and leave his place to a new man, and the process of education must be repeated. As a result, municipal public health is subject to too much local petty politics to make very much real, rapid progress. The medical health officer is compelled to struggle to obtain legislation from the council, and after he has it he should always be on the watch for attempts at cancellation and fight to maintain it as law.

The council must appoint a medical health officer who shall perform the duties prescribed in the Public Health Act and also those duties pre-

scribed by municipal by-law and resolution of the council at whatever remuneration the council may see fit to pay, and the medical health officer may be discharged at any time without notice, having no right of action against the municipality for wrongful dismissal. Furthermore, the duties of the medical health officer, as prescribed in the Act, are binding upon him, even if the council sees fit to ignore its responsibilities. Section 19 of the Public Health Act reads:

"The medical health officer shall be the chief municipal health and sanitary official, and shall perform all duties imposed upon him by the regulations of the minister and the fact that similar duties are or may be by statute imposed upon boards of health shall not relieve a medical health officer for the performance of his duties."

That is, circumstances might arise where an aggressive health officer might be dismissed by his council for doing his duty. The duties of the medical officer are unpleasant enough without having additional trouble with the council. Instead of the council restricting his powers he should feel free to do his duty supported in a legal way by the Provincial Department. In Ontario the medical health officer cannot be dismissed without the consent of the Provincial Board of Health, and, furthermore, if he is dissatisfied with his salary he has a right to appear in court before a district judge and have this matter adjusted, as was recently done by the medical health officer of Hamilton, Ontario.

Permit me further to mention that the remuneration for public health work done by some of the part time men in this Province is, in some instances, a joke. Every other branch of public service is fairly well paid for. The amount of money spent on building one mile of permanent highway would provide sufficient annual appropriation for nearly any rural health department in the Province. These are the conditions in public health work that cause dissatisfaction, and not only is there dissatisfaction on the part of some of the medical profession performing health duties in this Province, but it is fair to assume that the people are not entirely satisfied with the medical service they receive, as has been expressed by a recent resolution by the Farmers' Union asking for a medical clinic. If farmers, or any other class of people, think that they can violate all the laws of hygiene for 40 or 50 years and then come to a clinic to get patched up they are mistaken. Probably 70 or 80 per cent. of their troubles could have been prevented by consulting a physician well trained in prevention at the proper period of their life. I am not saying that a clinic is not a good thing, but I am trying to place the proper emphasis on prevention. I think some lessons for a clinic might be obtained from the way the Anti-Tuberculosis League handle their diagnostic work.

As far as preventive medicine is concerned most of us would agree

that some form of whole time local health organization under the supervision of the Provincial Department with sufficient appropriation is the ideal form for best results. 16 per cent. of the counties in the United States are thus organized into health districts. In New Zealand a local health unit consists of a whole time medical health officer, nurse and sanitary inspector. Their infant death rate is about one-half of ours, and this reduction is due largely to the well organized local health work carried on continuously. However, this ideal form of health organization is, I believe, premature for our sparsely settled Province. The total number of physicians in this Province is only about 544 for a population of 850,000, *i.e.*, 1 to 1600. Of this number, 174 physicians are practising in the cities, including Yorkton. There are only two whole time health officers in the Province. 178 districts have the services of one physician only, which means that any health work done in those parts of the Province must be done through each physician in his district as a part time official. 58 communities have two physicians between whom the work is often divided.

The trend of opinion of the authorities is to place preventive medicine back more in the hands of the practitioners. Much is to be said for this. After all, the physician knows best local conditions. He has intimate knowledge of family affairs and is able to follow the history of some of his patients from birth to death. In most instances he speaks with authority in his community on matters pertaining to public health. Because of the lack of proper training in preventive medicine his opinion in the past has not always been in the best interests of the health of the community. His grave words of wisdom against pasteurization of milk have prevented more than one municipality from getting a safe milk supply. Unfortunately he has been trained to think more about disease than about health. However, the universities are at last teaching preventive medicine to their students, so that recent graduates in medicine now help on the good work, and there is little to fear from the physician in that respect in future.

Sir George Newman, Chief Medical Officer of the Ministry of Health for Great Britain, at the opening of the new school of Hygiene, University of Toronto, said, "There can be no general advance in public health until the practitioner, who is in close touch with the people, is fired with ideals of preventive medicine."

After all, the lowering of the death rate and prevention of sickness has been due largely to the work of the physicians and nurses, and this done at the chance of obtaining less remuneration. If there is any reward from the practice of preventive medicine in future it surely belongs to them.

The opportunity for service in the practice of preventive medicine by practitioners or part time health officers is equal to, if not greater than

that of curative medicine, as for instance, work done in public health education, physical examination, mental hygiene, control of communicable disease, immunization of children, tuberculosis and venereal disease work, maternal and infant welfare work, etc. That the work is not done is indicated by the annual report of the Provincial Department of Health for 1925 in the findings of the pre-school examination clinics. For instance, 91 per cent. of children examined were not vaccinated; 93.8 per cent. were not immunized against diphtheria; 21.3 had abnormal tonsils; 15.2 per cent. had defective teeth, etc. The average defects for each child was 2.1 per cent. I understand these children are asked to go to their physician for treatment. It would be interesting to know how many went during the following year. It is rather a significant fact that physicians have failed in the past to treat these children at the early ages of one and two years when the liability of sickness and death is greatest.

Why should our schools be able to report upon so many defects? It is a very clear indication of the extent that preventive medicine is practised and the great possibilities of the future in this line. It will be readily admitted that the opportunities for service are great, but what about remuneration? It would appear as if few municipalities properly reward their medical health officers for services rendered. A few school districts pay for the immunization of their school children, but as yet, people have not been educated to pay for prevention. Let us take for example, health education, during the past year in Saskatoon there have been given eloquently by travelling, so-called doctors three courses of lectures on a mixture of fake religion and fake medicine offering pasteurization of milk and vaccination and inoculation for which they charged from $10.00 to $25.00 per capita for the course. If these men can get $25.00 for courses of lectures giving false information, why cannot the health officer receive pay for telling the truth?

Allow me to suggest a possible improvement in the status of medical health officers:

1. The health officer's position should be made more secure and free from local petty politics. The Provincial Department of Health should approve of the council's appointment of the health officer and his dismissal should only take place also with their approval.

2. The Provincial Department should contribute to the health officer's salary and compensate him for those duties he is obliged to perform under the authority of the Public Health Act, or, in the case of part time officers, payments could be made for certain specified duties performed for the government.

3. The Provincial Department of Health should carefully ascertain the needs of local health districts and provide the best possible legislation. Model legislation, perfect plumbing, pasteurization of milk, etc., might be

prepared to be adopted by councils if they wished. The medical health officer should be supported as far as possible in his attempt to enforce the law, as was done recently by the Provincial Department in changing the Public Health Act so that medical health officers could placard non-modern houses to compel the installation of plumbing. As a result of that change in the law practically all the houses on sewer and water lines in our City have been modernized to the advantage of the health of the people and an increased annual revenue to the City of $3,000 or $4,000. This could never have been done if the Provincial Department had not changed the legislation and supported heartily our work.

4. The annual appropriation for municipal health purposes should at least be approved of by the Provincial Department of Health if no grant is contributed toward the work. In the American whole time county health plan the federal and state departments of health both contribute to the annual budget, provided that the county pays its portion. The Province can find money for other branches of medical service. The government grant to hospitals is fast approaching a half million dollars which is spent for curative purposes.

An instance might be given of how the government could contribute to local departments of health in the immunization against communicable diseases. The Province spent in 1925, $10,500 on vaccines and sera, but nothing towards the expense of administration. It has been our experience that parents will usually not pay for the immunization of their children, but they do not object to having them done if it is free. The municipality rarely pays for this work. In order to induce the people to avail themselves of this protection, would it not be advisable to have a plan worked out between the Provincial Government and the local health departments to hold a free clinic for inoculations or vaccinations for three or four days each year before the school term opens? Some mutual arrangement could be made recompensing the health officer for this work, and those people wishing to do so could make use of the clinic, and the whole thing could be kept out of the hands of the municipal council. Other health activities might be worked out in some such way.

Any criticisms or suggestions presented here are not made in the spirit of fault-finding, but rather to provoke discussion, and probably some plan may be evolved in the near future by those in authority who are no doubt more capable of dealing with such problems than the speaker.

In spite of all the failings of the practitioners I am convinced that they and the local health organizations are the foundation on which the structure of the health and happiness of the people must be built, and therefore it is most important that the very best plan of organization for local health departments be obtained, as no other agency, official or voluntary, can do their work.

News Notes of Saskatchewan Health Officials' Association

The Second Annual Convention of the Saskatchewan Health Officials' Association was held at the Hotel Saskatchewan, Regina, on October 28th and 29th.

Over sixty members of the Association registered from all parts of the Province and a very enthusiastic meeting discussed many aspects of public health activity.

The Convention was welcomed by Mayor James McAra of Regina, who referred to the public health status of the Province of Saskatchewan and congratulated the Association on its excellent attendance at the second annual meeting.

Dr. Arthur Wilson, Medical Health Officer, Saskatoon and President of the Association departed from the usual custom of giving a presidential address and read in its place a paper on Rural Health Organization.

Eleven different papers were presented to the Association and fully discussed and amongst those who contributed to the programme were Mr. L. A. Thornton, B.Sc. City Commissioner of Regina, Mr. Stewart Young, B.A.Sc. Director of Town Planning, Regina, Dr. W. R. Coles, Medical Health Officer, Regina, Miss Marion Lindeburgh, Normal School, Regina, Miss Ruby Simpson, Director of School Hygiene, Regina, Dr. M. Barker, Chief Inspector, Health of Animals Branch, Dominion Department of Agriculture, Regina, Dr. W. H. Orme, City Health Department, Saskatoon, Mr. A. Roberts, City Health Department, Regina, Mr. A. J. Bolus, City Health Department, Fort William, Dr. J. H. Skaling, Medical Health Officer, Sutherland, Mr. D. K. Douglas, Milk and Dairy Inspector, City Health Department, Regina; Miss M. Strem, District Nurse, Neville; Miss C. R. Peers, Provincial Department of Public Health, Regina; Dr. R. G. Ferguson, Director of Medical Services, Sask. Anti-Tuberculosis League; Dr. Frances G. McGill, Director, Division of Laboratories, Department of Public Health, Regina; Mr. Leonard Shaw, Swift Current General Hospital, and Dr. H. C. Burroughs, Medical Health Officer, Swift Current.

The Hon. J. M. Uhrich, M.D., Minister of Public Health for Saskatchewan addressed the Convention at a luncheon given in the Hotel Saskatchewan.

At a business meeting held on October 29th, the following officers were elected for the ensuing year:—President, Dr. H. C. Burroughs,

Swift Current; Vice-President, Dr. J. H. Jackson, North Battleford; Executive, Miss Ruby Simpson, Regina, Dr. W. H. Orme, Saskatoon, Mr. E. G. Southon, Swift Current; Dr. W. R. Coles, Regina; Dr. B. M. Bayly, Moosejaw; Dr. H. C. Boughton, Saskatoon; Dr. Arthur Wilson (ex-officio) Saskatoon; Secretary-Treasurer, R. H. Murray, Regina. It was decided to hold the next Convention of the Association in the City of Saskatoon.

The membership of the Association consists of Medical Health Officers, Public Health and School Nurses, Public Health Engineers, Sanitary Officers, Laboratory Workers and Veterinary Officials and it is generally felt that the formation of the Association has marked a further advance in public health activities in the Province of Saskatchewan.

The Sanitary Inspectors' Association of Canada

The Annual Convention

By The Secretary

The Annual Convention held in Toronto, Ontario, on September 14th, 15th, and 16th, was a real success, both from the point of view of numbers and the inspiration gained from the papers, addresses and discussions.

The members of the Toronto Department of Health and the Provincial Department of Health were not slow in making the visiting delegates feel at home. Fifty delegates and friends signed the register. This is the largest number we have ever had.

The Sessions were held in the City Hall, Toronto, and we were indebted to the Toronto Board of Control for ample accommodation.

The Convention was scheduled to open at 9.30 on the morning of September 14th, and promptly at 9.32, His Worship Mayor Foster arrived in the room. The President, Mr. E. W. J. Hague of Winnipeg, immediately called the meeting to order and in a few brief words of introduction stated how pleased he was to see such a good turn-out. He thereafter introduced the Mayor and said how all were glad to see that His Worship had taken time from his busy life to visit us and address a few words of welcome.

Mayor Foster in his address said that his welcome on behalf of the City Council and citizens in general was most sincere. The keynote of His Worship's address was loyalty in service, without which no rich success could be obtained. There could be no such thing as carelessness in Public Health work. The health of the people could only be cared for by efficient labors and loyal service. In conclusion he hoped that our Convention would be a real success and that we would find time at the conclusion of our labors to see the beauty spots in and around the City. The President, in his usual genial manner, thanked His Worship for coming amongst us and for his kindly welcome.

Dr. Hastings, Toronto's venerable Medical Officer of Health, was also good enough to spend a while with us and on being called upon by the President, gave us a most inspiring and interesting address. Some of the points touched upon by Dr. Hastings were:—the importance of such gatherings as these, not only to the individual inspectors themselves, but to the Cities represented; the efficiency of the Inspectors charged with the

various duties that fall to be performed each day; politics should be divorced from Public Health work; education of the people in Public Health work should be undertaken by us, so that the public will see that they get what is required. He advised us to get our work done by making friends with the public and winning their support.

Hon. Dr. Forbes Godfrey, Minister of Health for Ontario, was unable to be with us, but he was ably represented by Dr. J. G. Cunningham of the Provincial Department of Health. As Dr. Cunningham's name was on the programme to address us at another time, he stated that on behalf of Hon. Dr. Forbes Godfrey he was pleased to welcome us to the Province of Ontario. He realized how difficult it was to build up a Dominion Association and to get a representative attendance; he thought we had done well in these respects and felt sure that those who were not able to be with us were behind us in our transactions. We need people in our work who have not lost the personal touch. We were in the position of getting the layman's point of view and for this reason we could occupy a larger place than others in the field of Public Health. He hoped our conference would be a clearing house of ideas.

Following Dr. Cunningham, we had a very able paper from Mr. H. Cusack, Chief of the Division of Sanitation, Toronto. Mr. Cusack's paper was on "Dwelling House Sanitation." This paper went into detail in the matters of dwelling construction from the point of view of sanitation, requirements of a healthful house, location, site, cellar, yard, roof, drains, plumbing, light, ventilation, gas fittings, etc. The paper showed evidence of much thought and was enjoyed by all, as was evidenced by the discussion which followed.

At the evening session we were favoured by a paper on "The duties of a Sanitary Inspector as related to those of the Medical Officer of Health," by Dr. D. V. Currey, Medical Officer of Health, St. Catharines, Ontario. Dr. Currey stressed the value of the Sanitary Inspector in modern City life and indicated the good work that is being done by the co-operation of the Medical Officer and the Sanitary Inspector.

A round table discussion on "Our Association, its past, present and future," was introduced by the Secretary, Mr. A. Officer. The Secretary briefly reviewed the work of the Association from its commencement in 1913 with an attendance of 17 at the inaugural meeting, 4 of whom are now dead. Reference was made to the standing that we now have in various parts of the country, the standard of qualifications now demanded in new appointments, and the number of Inspectors who have subsequently studied and prepared themselves for examination and obtained certificates of qualification.

Following this a general discussion took place relative to certain fea-

tures of the Constitution and By-laws, particularly the Associate Member clause and the subscription fee. With regard to the former, it was stated that a number of capable Inspectors were debarred from full membership on account of their lack of a qualifying certificate, and the suggestion was made that this requirement be abrogated for a few years at least. There was also a desire expressed that the subscription fee be reduced, there being so many calls on the average individual from other organizations, societies, etc., each year. These matters were referred to the Annual Meeting.

The forenoon of the 15th was spent in visits of inspection to the City Sewage Disposal Plant and the Garbage Incinerator. Reference has already been made in the Monthly Jottings to these visits. They were most interesting and a good deal was learned at both places.

The afternoon session was opened by an address on "Industrial Health and its relation to the Community," by Dr. J. G. Cunningham, Director, Division of Industrial Hygiene, Ontario. Dr. Cunningham gave us a very clear insight into the hazards in industry, touching on the charging of batteries, and referred to the dangers to health of benzine fumes, carbon monoxide, etc.

An address on "The progress of houehold sewage disposal," was given by Mr. A. E. Earl, Plumbing Inspector, Toronto. Mr. Earl gave us a very interesting talk, principally on the septic tank and the treatment of sewage by land filtration. The discussion that followed showed how interested the members were.

Following the above, a paper on "Milk-borne Typhoid, and the part played by the Sanitary Inspector in its prevention," was given by Mr. W. C. Millar, Provincial Sanitary Inspector, Fort William, Ontario. A good discussion took place which showed that the topic was a live one.

The Annual Business Meeting was held in the evening. There was an attendance of 26. Apologies of absence were read by the Secretary from Messrs. J. Butterfield, Edmonton; J. J. Dunn, Calgary; L. Robertson, Vancouver; A. Warr, Brandon; W. H. Appleton, Saskatoon; A. M. S. Allan, Regina; H. D. Mathias, Regina; J. B. Whiteoak, Calgary; T. Lancaster, Victoria; R. H. Meek, Vancouver; J. Arkle, St. James; R. B. Owens, Edmonton.

The minutes of the last Annual Meeting were read by the Secretary and adopted.

The following were admitted into membership: Messrs. E. J. Picton, Hamilton; C. S. Shain, Hamilton; A. C. Shain, Hamilton; J. Bowman, Barrie; A. White, Toronto; S. Allen, East York; J. Richardson, North Bay; F. Rothey, Sudbury; I. E. Dunn, Timmins; A. L. Smith, Toronto; F. W. Mason, Toronto, and C. S. Stapleton, Peterboro.

The Annual Report of the Executive Council, also the Branch Reports, were received and adopted; also the usual financial statement.

The Constitution and By-laws were amended as set forth in a circular letter mailed out to the members under date of August 11th, except that Section 5 was amended as follows: "Provided, that until September 1st, 1932, any persons holding an appointment as a full-time health official shall be eligible for full membership notwithstanding that he does not possess a certificate as defined above." It was felt that there were a number of capable men at present in Public Health work who, by reason of their not having a qualifying certificate, were not entitled to full membership. The change was made so that all such might have the full rights and privileges of members.

Messrs. A. White, W. C. Millar and H. Cusack were appointed a committee to interview Prof. Fitzgerald with the view to having a course of instruction for Sanitary Inspectors established in Ontario. The matter was further left in the hands of the Provincial Branch.

Respect to the memory of the late Mr. Thos. Watson, Mr. A. J. Pickett, and Mr. C. W. Chisholm, was shown by a standing silent vote.

On the recommendation of the Executive Council, the meeting decided to invite His Excellency the Governor-General, to become Patron and Dr. J. A. Amyot, Vice-Patron of the Association.

By a very large majority it was decided to hold next year's Convention in Vancouver, the dates to be decided upon by the Executive, after consultation with the Vancouver members.

The usual votes of thanks brought a very successful Annual Meeting to a close.

On September 16th, the morning session was addressed by Dr. Mumford on "Food and Public Health." Dr. Richmond was on the programme to speak on this subject, but as he had to be out of the City at this time, Dr. Mumford very kindly stepped into the gap and gave us a most interesting address. The speaker touched upon the sanitary conditions of places where bread, milk, meat, canned goods, soft drinks and fruit are made, stored, or handled. He also made suitable reference to refrigerators, floors, walls, light, ventilation, plumbing, lavatories, separation of living rooms from stores, etc. A lengthy discussion showed how much the address was appreciated.

Mr. J. VanBenschoten, Manager, Wallace and Tiernan, Limited, Toronto, gave us a splendid paper on "The proper methods respecting chlorination of water supplies." The paper was well received and, with the discussion that followed, brought out some very useful information.

The afternoon was spent on an inspection of the water filtration

plant on the Island, under the guidance of Mr. N. J. Howard, who spared no pains in making the trip well worth while.

This report would not be complete without making suitable reference to the excellent arrangements made for the Convention by Mr. H. Cusack and Mr. A. White. Practically all the details were arranged by Messrs. Cusack and White. We were also indebted to Mr. Cusack who arranged for the transportation of the members on the various trips of inspection, for the use of a suitable room in which to hold our meetings, for hospitality shown and other courtesies during the Convention.

Monthly Jottings of the Sanitary Inspectors' Association of Canada

A few extracts from the address of the new President of the English Sanitary Inspectors' Association, Prof. Leonard Hill, M.B., F.R.S., who is the Director of the Department of Applied Physiology, National Institute for Medical Research, may be of interest to our members. Prof. Hill, as President, succeeded another very brilliant Sanitarian, Sir William Collins. The address was given at the Annual Conference of the Sanitary Inspectors' Association, Plymouth. It is impossible in this column to review the proceedings of the Conference. The Association now has 2200 members.

"The Sanitary Inspectors stand in the front line of the forces mobilized for the Prevention of Disease, and I, devoting my research work to this end, could not, therefore, be called to a task more congenial than that of acting as your President. With the Medical Officers of Health behind you as headquarters staff, you push into all those places where disease must be fought, and on you then, in large measure, depends the safety and health of the people."

"It is by education in matters of health and improving factory and home conditions that most can be done."

"If mankind turned from wars to the prudent limitation of population combined with discipline of life and prevention of disease, what an increase of general happiness would result through the great discoveries of science."

"By education of the individual in hygiene and so increasing the vigour and health of the nation, not only might there be saved half or even more of this expenditure totalling some 300 millions, but the working power be so increased that the national income might be doubled or even trebled."

"The death rate in 23 American cities fell 79 per cent. between 1911 and 1922. The whole infant death rate fell 60 per cent. The fall in the death rate is mainly due to saving of infants and children. Irving Fisher points out that in the middle of the last century one quarter of the people died in England before they were 5 years old; at the beginning of this century one quarter died a little under 40. Using the same two dates, one half died by the age of 45 in the last century, and by 65 in this, while three-fourths died before the age of 70 in the last century, and a little over 75 in this. Thus the advance in this third quarter of life was

only a little over 5 years as against 30-35 years in the first quarter. M. Greenwood has pointed out that in the North-Western great industrial district there has been almost no advance in the last fifty years in respect of the late middle aged. The infants and children are being kept alive there, but not the middle aged. But supposing the same effort and discipline as are now given to saving children were supplied to preventive medicine after childhood and all through manhood, what then? Will human life be extended and centenarians become common? Irving Fisher says yes."

"Medical men have hitherto been trained mainly to diagnose and treat illness; they must in future be trained to prevent disease. The profession itself does not offer an example to the world as the clergy do of a very low mortality rate."

"But prevention is not simple, for it implies the recognition, not only of the means of combating acute infections, but of the power of chronic infections slowly to damage health, and the slow causation of these by habitual errors in diet, sedentary habits, excessive fatigue, etc."

"The whole attitude of both the public and the medical profession wants changing. At present the medical profession is paid for looking after ill people, consoling them, faith-healing them, and, in some cases, curing them by operation or specific means such as the cure of malaria by quinine, syphilis by salvarsan, amoebic dysentery by emitin, etc. The profession ought to be paid in the first case for supervision of those not yet ill, for the prevention of disease by education of the individual in personal hygiene."

"Crowding has most ill-effects on health. The striking fall in infant mortality of recent years is due not only to improved sanitation and welfare work, but to the fall in the birth rate, to the less crowded homes and better motherly care resulting therefrom."

"The ultra-violet rays of the sun which have great health giving properties are cut out by smoke pollution, so that I find by a simple method of measurement that Kingsway does not receive half of those which a clean country place receives."

"Much has been made in the past of sewer gas, the smell of drains, etc., but there is no evidence of the deleterious action of such. Sewer men are as healthy as any. While it is essential to prevent infection of water, food or air by pathogenic microbes, given clean water and food, and good ventilation, the stink of a drain has no ill effect other than a nervous one; the scents used by some people may be almost as offensive. The lessening of infection spread by flies has been one of the greatest results of cleaning up privies and courts. Money spent on sprinkling drains

and privies with antiseptics is wasted except in so far as these keep away flies."

A HAPPY NEW YEAR TO ALL OUR MEMBERS AND FRIENDS.

Let us make the New Year the best we have ever had. This can best be done by every member taking some share in our work.

ONTARIO

The Provincial Department of Health of Ontario

Communicable Diseases Reported for the Province by Local Boards of Health for the month of November, 1927.

COMPARATIVE TABLE

Diseases	1927 Cases	1927 Deaths	1926 Cases	1926 Deaths
Cerebro Spinal Meningitis	1	—	—	2
Chancroid	7	—	1	—
Chicken Pox	1080	—	1527	—
Diphtheria	343	17	393	14
Encephalitis	4	1	2	—
Gonorrhoea	190	—	157	—
Influenza	—	3	—	7
German Measles	14	—	15	—
Measles	542	—	746	—
Mumps	1007	—	47	—
Pneumonia	9	74	—	127
Poliomyelitis	7	—	8	1
Scarlet Fever	402	4	546	—
Smallpox	271	—	95	1
Syphilis	115	—	99	—
Tuberculosis	94	53	84	42
Typhoid	59	1	46	5
Whooping Cough	285	—	312	2
Dysentry	—	4	—	—

The following Municipalities reported cases of Smallpox:—

Port Elgin 1, Fitzroy 1, Gloucester 9, Ottawa 97, Tisdale 1, Kingston 1, Stirling 1, Grimsby N. 1, Elma 1, Fullarton 3, Logan 3, Peterboro 2, Himsworth S. 3, South River 3, Clarence 9, Cumberland 1, Charlton 6, Kitchener 7, East York 51, North York 11, Toronto 59.

News Notes

Unless some unexpected and unfavourable development occurs during the last quarter of 1927, the year will go on record as the healthiest one in Canada.

During the first nine months, says the bureau of statistics of the Metropolitan Life Insurance Company at Ottawa, the general death-rate has been reduced to 8.1 per 1,000, which is the lowest ever recorded. The death-rate from tuberculosis was also reduced to 76 per 100,000, which is a decline of 8 per cent over the corresponding period of 1926.

Measles, scarlet fever and whooping cough have shown a decided decline in death-rate, whilst diphtheria has slightly increased. A decline of 20 per cent in the death-rate is also reported in the case of pneumonia and intestinal diseases. The death-rate from cancer has been practically the same as in 1926, but slightly higher than it was in 1925.

Commencing next summer, as a further safeguard to the public health, the Ontario Department, under Hon. Dr. Forbes Godfrey, plans to bring all "over-night" tourist camps under a permit system. This is in no way an attempt to secure revenues by this method, or to invade the licensing rights of the municipalities. It is purely and simply a health measure.

The arrangement now contemplated would provide that no highway hostel proprietor could advertise his accommodation by signboard or otherwise until the proper medical authorities had first given his premises a clean bill of health.

Shortly before the end of the year, the Saskatchewan Department of Health carried on a health organization tour along preventive lines in the southern and western sections of the province. Dr. Singleton, M.H.O., was assisted by a public health nurse. The work done in Rouleau gives an indication of the methods used. There, 166 children were immunized against diphtheria and 75 protected from smallpox.

Kitchener hopes to have a V.D. clinic in operation within a few weeks. The decision to establish one there follows a determined effort on the part of local citizens to secure one, culminating when a deputation waited on the Minister of Health at Toronto and the request was subsequently granted. The actual administration will be in the hands of the civic health officer, Dr. J. W. Fraser.

Editorial

AN EDUCATIONAL OPPORTUNITY

In the current number of the JOURNAL there appears a popular article intended essentially for newspaper use on the subject of Diphtheria. This article was prepared because of the obvious need for the dissemination of knowledge on this subject.

The discovery of the value of Toxoid (Anatoxin Ramon) and toxin-anti-toxin constitutes one of the most important contributions made in the field of preventive medicine. The main obstacle in the way of their effective application is public apathy founded on ignorance of the facts, although perhaps one should not forget that at this time certain irresponsible agencies are making a business of circulating so-called popular health articles and pamphlets, carrying much dangerous misinformation both as to prevention and treatment.

The article included in the present issue is distributed in Ontario with the authority of the Provincial Department of Health and will doubtless be used by a number of newspapers. But this is not enough. Material of this type should appear in all newspapers. Permission has been granted for the free use of this material and any health officer in any part of Canada is at liberty to take the article as printed in the JOURNAL to his local editor and ask that it be reproduced.

In the meantime further information is being sent in to the office of the JOURNAL as to the effects of Toxoid in various Canadian cities.

For example, Dr. Adams reports that in the City of Windsor the rate of Diphtheria per 100,000 has fallen from a maximum of 485 to a minimum of 124 following the use of Toxoid, and that the rate of Diphtheria among children given two doses of Toxoid only is 0.64 as compared to a rate of 7.0 among children given no Toxoid.

Dr. Hutton, of Brantford, reports that following the use of Toxin-anti-toxin and later Toxoid, Diphtheria incidence has fallen from 103 cases in 1920 to 5 cases in 1927 up to November and that during the last three years there have been no deaths from Diphtheria in Brantford.

Dr. Roberts of Hamilton, reports that from 1915 to 1919 in Hamilton there were 1,001 cases with 116 deaths and from 1920 to 1924, 2,883 cases with 175 deaths. Immunization commenced in 1922 and after Dr. Roberts' campaign began to become effective there was a rapid drop, so that in the three years from 1924-1927 there were but 363 cases with 18 deaths. From November 1st, 1926 to September 30th, 1927, there were

ten cases with one death. In the case of the death Diphtheria had not been definitely diagnosed.

The editor of the PUBLIC HEALTH JOURNAL will be glad to call to the attention of its readers results in other cities if health officers will be good enough to send in statements. Meanwhile health officers are urged to use the material included in the current issue. The PUBLIC HEALTH JOURNAL will be glad to know of any success which health officers may have in having it utilized by their local press.

A UNIQUE PROPOSAL

A somewhat amusing but not unpractical propostion has been brought forward by a correspondent of the Canadian Social Hygiene Council in the form of a suggestion that in view of the fact that anti-vaccinationists are so certain of their facts they be given the opportunity to prove that they have the courage of their convictions.

The majority of the citizens have protected themselves and their children and are immune to smallpox. They, personally, will not suffer from the disease, if it should break out.

But they are living in a community in company with an unprotected section of the population. If smallpox does appear, it spreads among that particular group only.

An epidemic is a costly affair. Any outbreak loads a huge bill on the shoulders of the municipality, which must be paid. It is not fair, quite obviously, that people who have taken all necessary precautions, have protected themselves and their families against the actual disease, should be expected to dig into their pockets and pay—through their taxes—part of the loss incurred through the carelessness of others.

"It seems like an eminently fair proposal," this correspondent writes, "to suggest that the anti-vaccinationists be allowed to put themselves on record as such and be absolved from the necessity of protecting themselves against smallpox.

"But, in return for this concession to their personal opinions, on the part of the community as a whole, they should undertake to relieve other citizens of any financial responsibility in the event of a smallpox outbreak. That is, the anti-vaccinationists would undertake to provide and keep up the isolation hospital facilities which are required to care for these periodic cases of smallpox. They should provide medical and nursing care and shoulder the other economic losses, due to the interruption of business, loss of wages, etc., which even a mild epidemic involves.

"Under this arrangement, their beliefs would, in no way, be interfered with, and the very unjust condition which exists at the present

time would also be removed. People who do take advantage of the opportunity offered by medical science would not be obligated to meet bills for which others, who refuse to accept the medical man's verdict, are responsible."

It is likely that our irresponsible friends, the anti-vaccinationists, will be unable to see eye to eye with this fair-minded correspondent. Anti-vaccinationists faced with a serious epidemic run for cover. Faced with an ultra fair proposition such as this, they would run for cover again. But why not try the proposal out? One would expect that any fair-minded group anxious to prove their point would give clamorous approval. It will be interesting to watch the anti's reaction.

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